

REMARKS

This is responsive to the Office Action dated August 26, 2003 in which the Examiner rejects all pending claims 1 and 3 -11 as being obvious over combinations of Gill (US Patent No. 6,275,363), Gill (US Patent No. 6,219,209), Olivas et al (US Patent No. 6,507,187), Sano et al (US Patent No. 6,430,012) and Sasaki et al (US Patent No. 6,563,681). Applicants have further amended claim 1 to distinguish, in clearer language, the present invention from the cited prior art. Applicants respectfully traverse the rejections based on the amended claim as well as the detailed explanation below.

In particular, Applicants respectfully disagree with the assertion of the Examiner that the present invention is obvious over the combinations of the cited patents. As described in the application, the present invention discloses magneto-resistive device comprising a free and a pinned ferromagnetic layer separated by a Cu-type separation layer. The pinned ferromagnetic layer comprises an artificial antiferromagnet layer system (AAF). In particular, the AAF layer system comprises at least one CoFe layer, and the Cu-type separation layer is contiguous on both sides with a CoFe layer. The amendments to claim 1 clarify that the Cu-type separation layer is contiguous on one side with a CoFe layer of the free ferromagnetic layer, and is contiguous on another side with the CoFe layer of the AAF layer system of the pinned ferromagnetic layer. Claim 1 has been amended to more clearly define the above-underlined distinguishing features. As explained below, these features cannot be obtained from the combinations of the cited patents.

The Gill patents (US Patent Nos. 6,275,363 and 6,219,206) teach a tunnel junction sensor which comprises an AP pinned structure having multiple CoFe layers, which are separated from an AP coupled free layer by a barrier layer which includes an oxide layer and a Cu layer (see the '363 patent, Figure 12). The Gill patents, however, do not teach that the Cu layer is contiguous

to any of the CoFe layer of the pinned structure, as defined in amended claim 1. In fact, the Cu layer in the Gill patents is NOT contiguous with CoFe layer of the pinned structure. To the contrary, the Gill patents teach that the Cu layer is placed between the oxide layer and the free layer so as to improve the biasing of the free layer structure and promote symmetrical read-back signals (col. 8, lines 34-45, of the '363 patent).

Applicants respectfully disagree with the assertion of the Examiner that combining the Gill patents with the other cited patents renders the present invention obvious. In particular, none of the other three cited patents Olivas et al (US Patent No. 6,507,187), Sano et al (US Patent No. 6,430,012) or Sasaki et al (US Patent No. 6,563,681) discloses a pinned ferromagnetic layer that comprises an AAF layer system which includes at least one CoFe layer. Therefore, none of these three patents can provide a teaching or suggestion that the Cu layer, which separates the pinned layer and the free layer, is contiguous with a CoFe layer of an AAF layer. Thus, the applicants submit that no combinations of the teachings of these patents and the Gill patents can result in a Cu layer is contiguous with the CoFe layer of the AAF layer system, as recited in amended claim 1. Moreover, there is no motivation or suggestion in any of the cited patents for a combination that would result in the present invention as defined.

Therefore, Applicants believe that amended claim 1 is not obvious over any combinations of the cited patents, and thus is believed patentable. At least for the same reasons, Applicants submit that dependent claims 3-11 are also patentable as each of them includes all the features in claim 1.

Thus, the applicants respectfully request reconsideration and allowance of the application in view of the amendment and above explanations. The Examiner is authorized to deduct any fees believed due from our Deposit Account No. 11-0223.